



MAILDVDYITEEGKPVIRLFKKENGKFKIEHRTFRPYIYALLRDDSKIEEVKKITGERHGK
IVRIVDVEK
VEKKFLGKPITVWKLYLEHPQDVPTIREKVREHPAVVDIFEYDIPFAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPHYVEVVSSEREMIKRFLRIIREKD
PDIIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTLAVYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRLRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGGYGYAKARWYCKECAESVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEEDPKKKHYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKK

(SEQ ID NO.1)

type is:

MILDVDYITEEGKPVIRLFKKENGKFKIEHRTFRPYIYALLRDDSKIEEVKKITGERHGKI
VRIVDVEK
VEKKFLGKPITVWKLYLEHPQDVPTIREKVREHPAVVDIFEYDIPFAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPHYVEVVSSEREMIKRFLRIIREKD
PDIIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTLAVYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRLRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGGYGYAKARWYCKECAESVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEEDPKKKHYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKK

(SEQ ID NO.2)

(a) Pfu pol Y7A (Y8A)

MAILDVDAITEEGKPVIRLFKKENGKFKIEHRTFRPYIYALLRDDSKIEEVKKITGERHGK
IVRIVDVEK
VEKKFLGKPITVWKLYLEHPQDVPTIREKVREHPAVVDIFEYDIPFAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPYVEVVSSEREMIKRFLRIIREKD
PDIIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTL EAVYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGGYGYAKARWYCKEAE SVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLEIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEEDPKKKHYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKKK

(SEQ ID NO.3)

(b) Pfu pol Y37A (Y38A)

MAILDVDYITEEGKPVIRLFKKENGKFKIEHRTFRPAIYALLRDDSKIEEVKKITGERHGK
IVRIVDVEK
VEKKFLGKPITVWKLYLEHPQDVPTIREKVREHPAVVDIFEYDIPFAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPYVEVVSSEREMIKRFLRIIREKD
PDIIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTL EAVYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGGYGYAKARWYCKEAE SVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLEIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEEDPKKKHYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKKK

(SEQ ID NO.4)

(c) Pfu pol V93Q (V94Q)

MAILDVDYITEEGKPVIRLFKKENGKFKIEHRTFRPYIYALLRDDSKIEEVKKITGERHGK
IVRIVDVEK
VEKKFLGKPITVWKLYLEHPQDQPTIREKVVREHPAVVDIFEYDIPFAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPYVEVVSSEREMIKRFLRIIREKD
PDIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTLAVYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRLRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGGYGYAKARWYCKECAESVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEYDPPKKHKYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKK

(SEQ ID NO.5)

(d) Pfu pol V93R (V94R)

MAILDVDYITEEGKPVIRLFKKENGKFKIEHRTFRPYIYALLRDDSKIEEVKKITGERHGK
IVRIVDVEK
VEKKFLGKPITVWKLYLEHPQDRPTIREKVVREHPAVVDIFEYDIPFAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPYVEVVSSEREMIKRFLRIIREKD
PDIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTLAVYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRLRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGGYGYAKARWYCKECAESVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEYDPPKKHKYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKK

(SEQ ID NO.6)

(e) Pfu pol I114R (I115R)

MAILDVDAITTEEGKPVIRLFKKENGKFKIEHDRTFRPYIYALLRDDSKIEEVKKITGERHGK
IVRIVDVEK
VEKKFLGKPITVWKLYLEHPQDVPTIREKVVREHPAVVDIFEYDRPFAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPYVEVVSSEREMIKRFLRIIREKD
PDIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTLAAYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRLRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGYGYAKARWYCKECAESVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEYDPKKHKYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKK

(SEQ ID NO.7)

(f) Pfu pol I114Q (I115Q)

MAILDVDYITEEGKPVIRLFKKENGKFKIEHDRTFRPAIYALLRDDSKIEEVKKITGERHGK
IVRIVDVEK
VEKKFLGKPITVWKLYLEHPQDVPTIREKVVREHPAVVDIFEYDQPPAKRYLIDKGLIPMEGE
EELKILAF
DIETLYHEGEEFGKGPIIMISYADENEAKVITWKNIDLPYVEVVSSEREMIKRFLRIIREKD
PDIIVTYN
GDSFDFPYLAKRAEKLGIKLTIGRDGSEPKMQRIGDMTAVEVKGRIHFDLYHVITRTINLPT
YTLAAYE
AIFGKPKEKVYADEIAKAWESGENLERVAKYSMEDAKATYELGKEFLPMEIQLSRLVGQPLW
DVSRSTG
NLVEWFLLRKAYERNEVAPNKPSEEEYQRRRLRESYTGGFVKEPEKGLWENIVYLDLFRALYPS
IIITHNVS
PDTLNLEGCKNYDIAPQVGHKFCKDIPGFIPSLLGHLLEERQKIKTKMKETQDPIEKILLDY
RQKAIKLL
ANSFYGYGYAKARWYCKECAESVTAWGRKYIELVWKELEEKFGFKVLYIDTDGLYATIPGG
ESEEIKKK
ALEFVKYINSKLPGLLELEYEGFYKRGFFVTKKRYAVIDEEGKVITRGLIVRRDWSEIAKE
TQARVLET
ILKHGDVEEAVRIVKEVIQKLANYEIPPEKLAIYEQITRPLHEYKAIGPHVAVAKKLAAGV
KIKPGMVI
GYIVLRGDGPISNRAILAEYDPKKHKYDAEYYIENQVLPVLRILEGFGYRKEDLRYQKTR
QVGLTSWL
NIKK

(SEQ ID NO.8)

(a) Pfu pol Y7A (Y8A)

ATGGCTATCCTGGACGTTGACGCCATCACCGAAGAAGGTAAGCCGGTTATCCGTCTGTTCAA
AAAAGAAAACGGTAAATTCAAAATCGAACACGACCGTACCTTCCGTCCGTACATCTACGCTC
TGCTGCGTGACGACTCTAAAATCGAAGAAGTTAAAAAATCACCGGTGAACGTCATGGAAAG
ATTGTGAGAATTGTTGATGTAGAGAAGGTTGAGAAAAAGTTTCTCGGCAAGCCTATTACCGT
GTGGAAACTTTATTTGGAACATCCCCAAGATGTTCCCACTATTAGAGAAAAAGTTAGAGAAC
ATCCAGCAGTTGTGGACATCTTCGAATACGATATTCCATTTGCAAAGAGATACCTCATCGAC
AAAGGCCCTAATACCAATGGAGGGGGAAGAAGAGCTAAAGATTCTTGCCTTCGATATAGAAAC
CCTCTATCACGAAGGAGAAGAGTTTGGAAAAGGCCCAATTATAATGATTAGTTATGCAGATG
AAAATGAAGCAAAGGTGATTACTTGGAAAAACATAGATCTTCCATACGTTGAGGTTGTATCA
AGCGAGAGAGAGATGATAAAGAGATTTCTCAGGATTATCAGGGAGAAGGATCCTGACATTAT
AGTTACTTATAATGGAGACTCATTCGACTTCCCATATTTAGCGAAAAGGGCAGAAAACTTG
GGATTAAATTAACCATTTGGAAGAGATGGAAGCGAGCCCAAGATGCAGAGAATAGGCGATATG
ACGGCTGTAGAAGTCAAGGGAAGAATACATTTGACTTGTATCATGTAATAACAAGGACAAT
AAATCTCCCAACATACACACTAGAGGCTGTATATGAAGCAATTTTGGAAAGCCAAAGGAGA
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AAATACTCGATGGAAGATGCAAAGGCAACTTATGAAGTCTGGGAAAGAATTCCTTCCAATGGA
AATTCAGCTTTCAAGATTAGTTGGACAACCTTTATGGGATGTTTCAAGGTCAAGCACAGGGA
ACCTTGTTAGAGTGGTTCTTACTTAGGAAAGCCTACGAAAGAAACGAAGTAGCTCCAAACAAG
CCAAGTGAAGAGGAGTATCAAAGAAGGCTCAGGGAGAGCTACACAGGTGGATTTCGTTAAAGA
GCCAGAAAAGGGGTTGTGGGAAAACATAGTATACCTAGATTTTAGAGCCCTATATCCCTCGA
TTATAATTACCCACAATGTTTCTCCCGATACTCTAAATCTTGAGGGATGCAAGAAGTATGAT
ATCGCTCCTCAAGTAGGCCACAAGTTCTGCAAGGACATCCCTGGTTTTATACCAAGTCTCTT
GGGACATTTGTTAGAGGAAAGACAAAAGATTAAGACAAAAATGAAGGAACTCAAGATCCTA
TAGAAAAAATACTCCTTGACTATAGACAAAAAGCGATAAACTCTTAGCAAATTTCTTTCTAC
GGATATTATGGCTATGCAAAAGCAAGATGGTACTGTAAGGAGTGTGCTGAGAGCGTTACTGC
CTGGGGAAGAAAGTACATCGAGTTAGTATGGAAGGAGCTCGAAGAAAAGTTTGGATTTAAAG
TCCTCTACATTGACACTGATGGTCTCTATGCAACTATCCCAGGAGGAGAAAAGTGAGGAAATA
AAGAAAAAGGCTCTAGAATTTGTAAAATACATAAATTCAAAGCTCCCTGGACTGCTAGAGCT
TGAATATGAAGGGTTTTATAAGAGGGGATTCTTCGTTACGAAGAAGAGGTATGCAGTAATAG
ATGAAGAAGGAAAAGTCATTACTCGTGGTTTAGAGATAGTTAGGAGAGATTGGAGTGAAATT
GCAAAAGAACTCAAGCTAGAGTTTGGAGACAATACTAAAACACGGAGATGTTGAAGAAGC
TGTGAGAATAGTAAAAGAAGTAATACAAAAGCTTGCCAATTATGAAATTCACCAGAGAAGC
TCGCAATATATGAGCAGATAACAAGACCATTACATGAGTATAAGGCGATAGGTCCTCACGTA
GCTGTTGCAAGAACTAGCTGCTAAAGGAGTTAAAATAAAGCCAGGAATGGTAATTGGATA
CATAGTACTTAGAGGCGATGGTCCAATTAGCAATAGGGCAATTCTAGCTGAGGAATACGATC
CCAAAAAGCACAAGTATGACGCAGAATATTACATTGAGAACCAGGTTCTTCCAGCGGTACTT
AGGATATTGGAGGGATTTGGATACAGAAAGGAAGACCTCAGATACCAAAGACAAGACAAGT
CGGCCTAACTTCCTGGCTTAACATTAATAATCC

(SEQ ID NO.9)

(b) Pfu pol V93Q (V94Q)

ATGGCTATCCTGGACGTTGACTACATCACCGAAGAAGGTAAGCCGGTTATCCGTCTGTTCAA
AAAAGAAAACGGTAAATTCAAAATCGAACACGACCGTACCTTCCGTCCGTACATCTACGCTC
TGCTGCGTGACGACTCTAAAATCGAAGAAGTTAAAAAATCACCGGTGAACGTCATGGAAAG
ATTGTGAGAATTGTTGATGTAGAGAAGGTTGAGAAAAAGTTTCTCGGCAAGCCTATTACCGT
GTGGAAACTTTATTTGGAACATCCCCAAGATCAGCCCACTATTAGAGAAAAAGTTAGAGAAC
ATCCAGCAGTTGTGGACATCTTCGAATACGATATTCCATTTGCAAAGAGATACCTCATCGAC
AAAGGCCCTAATACCAATGGAGGGGGAAGAAGAGCTAAAGATTCTTGCCTTCGATATAGAAAC
CCTCTATCACGAAGGAGAAGAGTTTGGAAAAGGCCCAATTATAATGATTAGTTATGCAGATG
AAAATGAAGCAAAGGTGATTACTTGGAAAAACATAGATCTTCCATACGTTGAGGTTGTATCA

AGCGAGAGAGAGATGATAAAGAGATTTCTCAGGATTATCAGGGAGAAGGATCCTGACATTAT
AGTTACTTTATAATGGAGACTCATTGACTTTCCCATATTTAGCGAAAAGGGCAGAAAACTTG
GGATTAAATTAACCATTTGGAAGAGATGGAAGCGAGCCCAAGATGCAGAGAATAGGCGATATG
ACGGCTGTAGAAGTCAAGGGAAGAATACATTTGCACTTGTATCATGTAATAACAAGGACAAT
AAATCTCCCAACATACACACTAGAGGCTGTATATGAAGCAATTTTTGGAAGCCAAAGGAGA
AGGTATACGCCGACGAGATAGCAAAAGCCTGGGAAAGTGGAGAGAACCTTGAGAGAGTTGCC
AAATACTCGATGGAAGATGCAAAGGCAACTTATGAACTCGGGAAAGAATTCCTTCCAATGGA
AATTCAGCTTTCAAGATTAGTTGGACAACCTTTATGGGATGTTTCAAGGTCAAGCACAGGGA
ACCTTGAGAGTGGTTCTTACTTAGGAAAGCCTACGAAAGAAACGAAGTAGCTCCAAACAAG
CCAAGTGAAGAGGAGTATCAAAGAAGGCTCAGGGAGAGCTACACAGGTGGATTTCGTTAAAGA
GCCAGAAAAGGGTTGTGGGAAAACATAGTATACCTAGATTTTAGAGCCCTATATCCCTCGA
TTATAATTACCCACAATGTTTCTCCCGATACTCTAAATCTTGAGGGATGCAAGAACTATGAT
ATCGCTCCTCAAGTAGGCCACAAGTTCTGCAAGGACATCCCTGGTTTTATACCAAGTCTCTT
GGGACATTTGTTAGAGGAAAGACAAAAGATTAAGACAAAAATGAAGGAACTCAAGATCCTA
TAGAAAAATACTCCTTGACTATAGACAAAAGCGATAAAACTCTTAGCAAATTTCTTTCTAC
GGATATTATGGCTATGCAAAGCAAGATGGTACTGTAAGGAGTGTGCTGAGAGCGTTACTGC
CTGGGGAAGAAAGTACATCGAGTTAGTATGGAAGGAGCTCGAAGAAAAGTTTGGATTTAAAG
TCCTCTACATTGACACTGATGGTCTCTATGCAACTATCCCAGGAGGAGAAAGTGAGGAAATA
AAGAAAAGGCTCTAGAATTTGTAAAATACATAAATTCAAAGCTCCCTGGACTGCTAGAGCT
TGAATATGAAGGGTTTTATAAGAGGGGATTCTTCGTTACGAAGAAGAGGTATGCAGTAATAG
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GCAAAAGAACTCAAGCTAGAGTTTTGGAGACAATACTAAAAACACGGAGATGTTGAAGAAGC
TGTGAGAATAGTAAAAGAAGTAATACAAAAGCTTGCCAATTATGAAATTCCACCAGAGAAGC
TCGCAATATATGAGCAGATAACAAGACCATTACATGAGTATAAGGCGATAGGTCCCTCACGTA
GCTGTTGCAAAGAACTAGCTGCTAAAGGAGTTAAATAAAGCCAGGAATGGTAATTGGATA
CATAGTACTTAGAGGCGATGGTCCAATTAGCAATAGGGCAATTCTAGCTGAGGAATACGATC
CCAAAAGCACAAGTATGACGCAGAATATTACATTGAGAACCAGGTTCTTCCAGCGGTACTT
AGGATATTGGAGGGATTTGGATACAGAAAGGAAGACCTCAGATACCAAAAGACAAGACAAGT
CGGCCTAACTTCCTGGCTTAACATTAAAAAATCC

(SEQ ID NO.10)

(c) Pfu Pol P115Δ (P116Δ)

ATGGCTATCCTGGACGTTGACTACATCACCGAAGAAGGTAAGCCGGTTATCCGTCTGTTCAA
AAAAGAAAACGGTAAATTCAAAATCGAACACGACCGTACCTTCCGTCCGTACATCTACGCTC
TGCTGCGTGACGACTCTAAATCGAAGAAGTTAAAAAATCACCGGTGAACGTCATGGAAAG
ATTGTGAGAATTGTTGATGTAGAGAAGGTTGAGAAAAAGTTTCTCGGCAAGCCTATTACCGT
GTGGAAACTTTATTTGGAACATCCCCAAGATGTTCCCACTATTAGAGAAAAAGTTAGAGAAC
ATCCAGCAGTTGTGGACATCTTCGAATACGATATTTTTGCAAAGAGATACCTCATCGACAAA
GGCCTAATACCAATGGAGGGGGAAGAAGAGCTAAAGATTCTTGCCTTCGATATAGAAACCTT
CTATCACGAAGGAGAAGAGTTTGGAAAAGGCCCAATTATAATGATTAGTTATGCAGATGAAA
ATGAAGCAAAGGTGATTACTTTGGAAAACATAGATCTTCCATACGTTGAGGTTGTATCAAGC
GAGAGAGAGATGATAAAGAGATTTCTCAGGATTATCAGGGAGAAGGATCCTGACATTATAGT
TACTTATAATGGAGACTCATTGACTTTCCCATATTTAGCGAAAAGGGCAGAAAAACTTGGGA
TTAAATTAACCATTTGGAAGAGATGGAAGCGAGCCCAAGATGCAGAGAATAGGCGATATGACG
GCTGTAGAAGTCAAGGGAAGAATACATTTGCACTTGTATCATGTAATAACAAGGACAATAAA
TCTCCCAACATACACACTAGAGGCTGTATATGAAGCAATTTTTGGAAGCCAAAGGAGAAGG
TATACGCCGACGAGATAGCAAAAGCCTGGGAAAGTGGAGAGAACCTTGAGAGAGTTGCCAAA
TACTCGATGGAAGATGCAAAGGCAACTTATGAACTCGGGAAAGAATTCCTTCCAATGGAAAT
TCAGCTTTCAAGATTAGTTGGACAACCTTTATGGGATGTTTCAAGGTCAAGCACAGGGAACC
TTGTAGAGTGGTTCTTACTTAGGAAAGCCTACGAAAGAAACGAAGTAGCTCCAAACAAGCCA
AGTGAAGAGGAGTATCAAAGAAGGCTCAGGGAGAGCTACACAGGTGGATTTCGTTAAAGAGCC
AGAAAAGGGTTGTGGGAAAACATAGTATACCTAGATTTTAGAGCCCTATATCCCTCGATTA
TAATTACCCACAATGTTTCTCCCGATACTCTAAATCTTGAGGGATGCAAGAACTATGATATC

GCTCCTCAAGTAGGCCACAAGTTCTGCAAGGACATCCCTGGTTTTATACCAAGTCTCTTGGG
ACATTTGTAGAGGAAAGACAAAAGATTAAGACAAAATGAAGGAACTCAAGATCCTATAG
AAAAAATACTCCTTGACTATAGACAAAAGCGATAAACTCTTAGCAAATTCCTTTCTACGGA
TATTATGGCTATGCAAAAGCAAGATGGTACTGTAAGGAGTGTGCTGAGAGCGTTACTGCCTG
GGGAAGAAAGTACATCGAGTTAGTATGGAAGGAGCTCGAAGAAAAGTTTGGATTTAAAGTCC
TCTACATTGACACTGATGGTCTCTATGCAACTATCCCAGGAGGAGAAAGTGAGGAAATAAAG
AAAAAGGCTCTAGAATTTGTAAAATACATAAATTCAAAGCTCCCTGGACTGCTAGAGCTTGA
ATATGAAGGGTTTTATAAGAGGGGATTCTTCGTTACGAAGAAGAGGTATGCAGTAATAGATG
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AAAGAACTCAAGCTAGAGTTTGGAGACAATACTAAACACGGAGATGTTGAAGAAGCTGT
GAGAATAGTAAAAGAAGTAATACAAAAGCTTGCCAATTATGAAATTCACCAGAGAAGCTCG
CAATATATGAGCAGATAACAAGACCATTACATGAGTATAAGGCGATAGGTCCCTCACGTAGCT
GTTGCAAAGAACTAGCTGCTAAAGGAGTTAAAATAAAGCCAGGAATGGTAATTGGATACAT
AGTACTTAGAGGCGATGGTCCAATTAGCAATAGGGCAATTCTAGCTGAGGAATACGATCCCA
AAAAGCACAAGTATGACGCAGAATATTACATTGAGAACCAGGTTCTTCCAGCGGTACTTAGG
ATATTGGAGGGATTGGATACAGAAAGGAAGACCTCAGATACCAAAGACAAGACAAGTCGG
CCTAACTTCCTGGCTTAACATTAATAAATCC

(SEQ ID NO.11)

Seq id no. 12

MILDTDYITEDGKPVIRIFKKENGFEFKIDYDRNFEPYIYALLKDDSAIEDVKKITAERHGT
VRVRAEKVKKKFLGRPIEVWKLYFTHPQDVPAIRDKIKEHPAVVDIYEYDIPFAKRYLIDK
GLIPME

Seq id no.13

MKEFYLTVEQIGDSIFERYIDSNGRERTREVEYKPSLFAHCPESQATKYFDIYGKPCTRKLF
ANMRDASQWIKRMEDIGLEALGMDDFKLAYLSDTYNYEIKY

5'-GGGGATCCTCTAGAGTCGACCTGC-3' (SEQ ID NO.14))

SEQ ID NO.15

GGAGACAAGCTTGUATGCCTGCAGGTCGACTCTAGCGGCTAAAA

SEQ ID NO.17

GGAGACAAGCTTGTATGCCTGCAGGTCGACTCTAGCGGCTAAAA

(SEQ ID NO.16)

5'-hex-GCCCGCGGGAUATCGGCCCTTA-3'

Pfu (SEQ ID NO 18)

MILDVDYITEEGKPVIRLFFKKENGKFKIEHDRTRFPYIYALLRDDSKIEEVKKITGERHGKI
VRIVDVEKVEKKFLGKPITVWKLYLEHPQDVPTIREKVRHHPAVVDIFEYDIPFAKRYLIDK
GLIPMEG

Tgo

MILDTDYITEDGKPVIRIFKKENGFEFKIDYDRNFEPYIYALLKDDSAIEDVKKITAERHGT
VRVRAEKVKKKFLGRPIEVWKLYFTHPQDVP AIRDKIKEHPAVVDIYEYDIPFAKRYLIDK
GLIPMEG

PKOD

MILDTDYITEDGKPVIRIFKKENGFEFKIEYDRTFEPYFYALLKDDSAIEEVKKITAERHGT
VTVKRVEKVQKKFLGRPVEVWKLYFTHPQDVP AIRDKIREHPAVIDIYEYDIPEAKRYLIDK
GLVPMEG

DTok

MILDADYITEDGKPVIRVFKKEKGEFKIDYDRDFEPYIYALLKDDSAIEDIKKITAERHGT
VRVTRAERVKKKFLGRPVEVWKLYFTHPQDVP AIRDKIREHPAVVDIYEYDIPFAKRYLIDR
GLIPMEG

9° N-7

MILDTDYITENGKPVIRVFKKENGFEFKIEYDRTFEPYFYALLKDDSAIEDVKKVTAKRHGT
VKVKRAEKVQKKEFLGRPIEVWKLYFNHPQDVP AIRDRIRAHPAVVDIYEYDIPFAKRYLID
KGLIPMEG

Tli

MILDTDYITKDGKPIIRIFKKENGFEFKIELDPHFQPYIYALLKDDSAIEEIKAIKGERHGKT
VRVLDVAVKVRKKFLGREVEVWKLIFEHPQDVPAMRGKIREHPAVVDIYEYDIPFAKRYLIDK
GLIPMEG

Mvo

MDLDYNSKDLCIDMYKNCGLKKPEINLQKECEF KPYFYVDTSEPKEIYDYLDGLNQEIDLK
KLEPEFENNTSLKVQDLITNIEIEKIVYS DYILNGKDISEVSDFKNKKERKICKVYVKYPN
HVKIIREYFKEFGKSYEFDIPFLRRYMIDQDIVPSAK

Pis

MELKVWPLDITYAVVGSVPEIRIFGILSSGERVVLIDRSFKPYFYVDCAVCEPAALKTALSR
VAPIDDVQIVERRFLGRSKFLKVIKIPEDVRKLREAAMSI PRVSGVYEADIRFYMRYMID
MGVVPCSW

Afu

MERVEGLIDADYETIGGKAVVRLWCKDDQGIFVAYDYNFDPYFYVIGVDEDILKNAATSTR
REVIKLKSFEKAQLKTLGREVEGYIVYAHHPQHVPKLRDYL SQFGDVREADIPFAYRYLIDK
DLACMDG

Csy

TVQDAVEIPPSLLVSATYDSQAGAVVLKFYEPESQKIVHWDNTGHKPYCYTRQPPSELGEL
EGREDVLGTEQVMRHDLIADKDVPTKITVADPLAIGGTNSEKSIRNIMDTWESDIKYYENY
LYDKSLVVGRY

Sac

WIKAEADGKVYFLLQVDYDGKKSRVCKLYDKEGKKIYIMQDESGHKPYFLTDIDPDKVNKI
TKVVRDPSFDHLELINKVDPYTGKKIRLTKIVVKDPLAVRRMRSSLPKAYEAHIKYNNYVY
DNGLIPGLI

Soh

WIKAEEGKSYFLLQVDYDGKKSKAICKLYDKETKKIYILYDNTGHKPYFLTDIDPEKVNKI
PKVVRDPSFDHLETVIKIDPYSGNKIKLTKIVVKDPLAVRRMRNSVPKAYEAHIKYFNYYIY
DLGLIPGLP

Sso

WLEEAQENKIYFLLQVDYDGKKGKAVCKLFDKETQKIYALYDNTGHKPYFLVDLEPDKVGKI
PKIRDPSFDHIETVSKIDPYTWNKFKLTKIVVRDPLAVRRLRNDVPKAYEAHIKYFNMYD
IGLIPGMP

Poc

KPLEARDGVEGFLLQTMVDGERGVAAAKIYDDRNGIVVYFDRTGYMPYFLTDIPDKLQEL
HEVVRHKGFDHVEVVEKFDLLRWQRRKVTIKIVVKTPDVVRVLRDKVPRAW EANIKFHHNYIY
DYGLVPGMK

Ape

VREPWVESVRGYLLDVRYDGS LGKAVLMLYDPSSGSLVKWADRTGHKPYFLTDARPEDLRAA
GVDVSHDESFLQYDLVEKFHPIDRKLKLYKIVVSDPLAVRRLREKVSSAGFSVWEADIKYH
HNYIFDRQLIPGIL

Amino acid motif is:

E--I-F/Y---Y-D

(SEQ ID NO.19)